Discovering Energy Savings with Energy Treasure Hunts

2020 ENERGY STAR Partner of the Year Winner Webinar Series

April 29, 2020

Thanks for joining us!

- Let us know if there are ways ENERGY STAR can help

- Today: the first in series of our 2020 Partner of Year Award Winner webinar series

https://www.energystar.gov/buildings/training/poy_webinars

Today's Speakers

- **Barry Abramson,** Principal, Servidyne LLC, Atlanta GA
  Servidyne is a 2020 ENERGY STAR Sustained Excellence Award winner and earned its first Partner of Year award in 2002

- **Tyler Puls,** Energy and Environmental Specialist, Des Moines Public Schools, Des Moines IA.
  DMPS is a 2020 ENERGY STAR Sustained Excellence Award winner and earned its first Partner of Year award in 2012

Energystar.gov/awards

Moderator:

- **Walt Tunnessen**, ENERGY STAR Industrial Program Manage, US EPA, Washington DC

Background on Energy Treasure Hunts

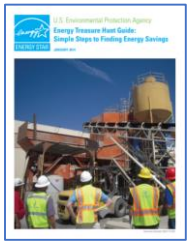
TOYOTA

Suppliers

2008
Great
Recession

Industrial
Partners

2014
Guidebook



2018
Short Guide, Videos,
Treasure Maps,
Detail Sheets

2019
Launch Campaign

FIND THE TREASURE
IN YOUR FACILITY

Hundreds of Industrial Companies

During an Energy Treasure Hunt, teams walk around a facility looking for quick ways to save energy. Those quick fixes can add up to big savings. Hundreds of organizations have used Energy Treasure Hunts to reduce their facilities' energy use by up to 15 percent. Are you and your crew ready to find the treasure buried within your facilities?

Main | Resources | Participants | Submit | Eligibility | Video case studies

4,300,000
Potential energy savings found (MMBtu)

22.5
Potential cost savings (millions of dollars)

229,000
Potential emissions avoided (metric tons CO2e)

Name: Amcor
Type: Pharmaceutical, food, and home-care products packaging supplier
More >

Name: Colgate-Palmolive
Type: Consumer products
Potential Savings: 9.6%, 3.4%, 6.8%, 3.5%, 16.1%, 5.5%
More >

Name: Sherwood Cass R-VIII School District
Type: High School
More >

Name: Allergan
Type: Pharmaceutical manufacturing company
Potential Savings: 21%, 50%
More >

Name: Columbia Association
Type: Property management organization
Potential Savings: $2,400
More >

Name: The Boeing Company
Type: Aircraft, satellite, and telecommunications manufacturing
Potential Savings: 7.3%, 19.7%, 6.7%, 17.9%
More >

Name: Kilroy Realty Corporation
Type: Real Estate Investment Trust
Potential Savings: $20,300
More >

Name: Lockheed Martin
Type: Aerospace, defense, and advanced technologies
Potential Savings: 12%, 5%, 17%, 3%, 19%, 5%
More >

2019 Results

35 organizations

145 Teams & Hunts

Lost of potential savings!

Energystar.gov/treasurehunt

What's an Energy Treasure Hunt?

- Process for finding no and low cost energy savings opportunities:
  - Typically a 1 – 3 day "event"
  - Conducted during non-business & business hours
  - Concludes with report-out to management
- Involves internal staff who may be supplemented by outside experts
- Engages senior management / financial decision makers to authorize action on projects
- Establishes an action plan for implementation

Treasure Hunts vs Audits

- TH are less threating to employees than audits or assessments
  - Focus on “opportunities,” not problems
  - Engage employees responsible for implementation
  - Help build energy teams
- TH generally look for operational & behavioral opportunities
  - Pick the low hanging fruit
  - Identify opportunities for further study (capital projects)
- TH get management approval to implement findings at the end of the event

TH can be expanded to address water, safety, and other issues.

Des Moines Public Schools

Discovering Energy Savings with Treasure Hunts

April 29, 2020

Tyler Puls – Energy and Environmental Specialist

Think. Learn. **Grow.**

www.dmschools.org

Our Mission:

Providing Students with the Knowledge, Skills and Abilities to be Successful at the Next Stage of Their Lives

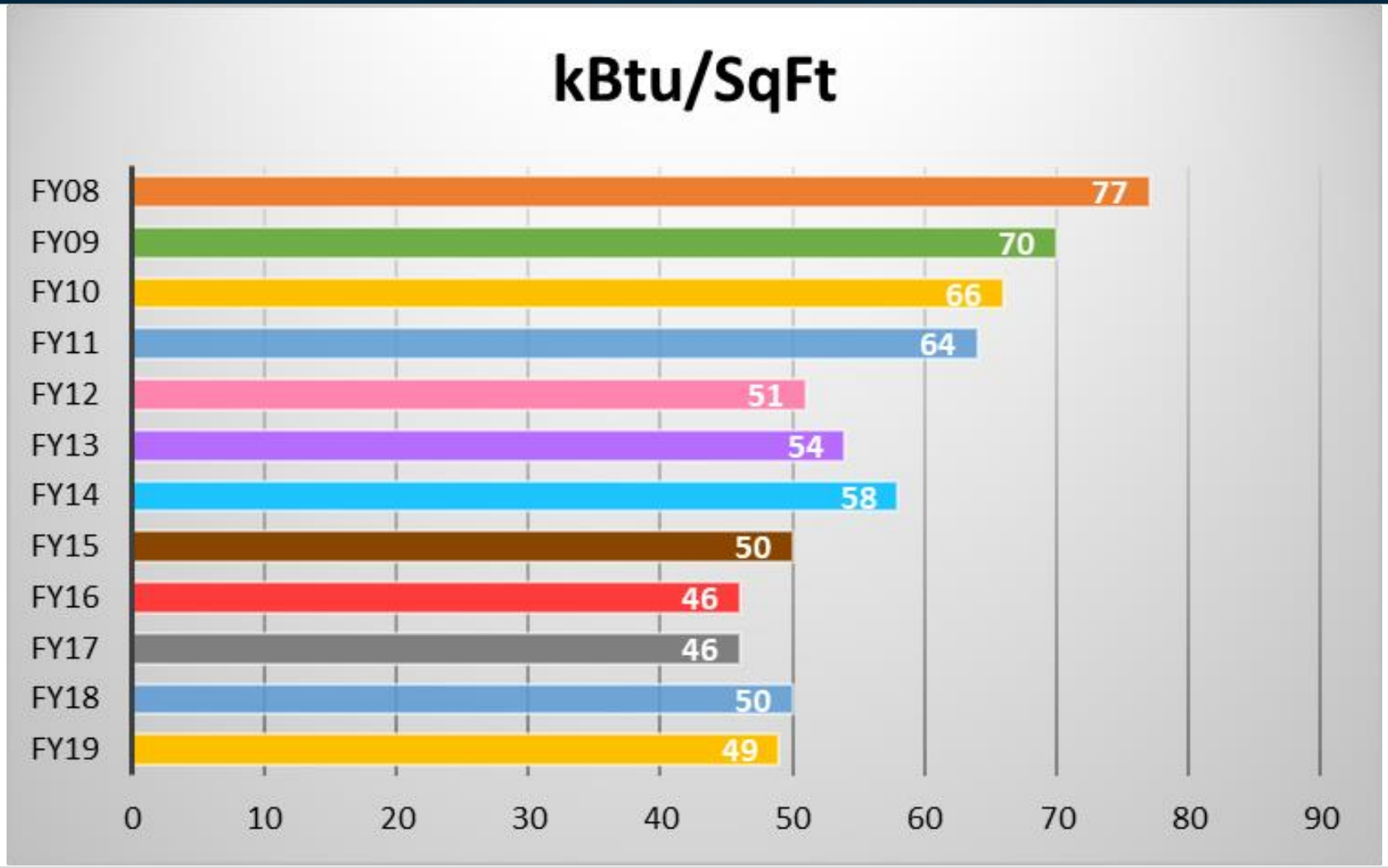
DMPS Overview

- >6,000,000 Square Feet Under Roof
- 73 Facilities
  - 39 Elementary Schools
  - 10 Middle Schools
  - 1 9th Grade Academy
  - 5 High Schools
  - 5 Alternative/Pre-K Early Learning Centers
  - 1 Career and Technical Center
  - 12 Support/Auxiliary Facilities
- Average Age of DMPS Buildings = >65 years
- 33,000+ Students
- 4,900+ Staff

DMPS & ENERGY STAR

Partner of the Year – Energy Management 2012 to 2020
Partner of the Year – Climate Communicator 2014 to 2016
80% of Eligible Buildings are Currently ENERGY STAR Certified

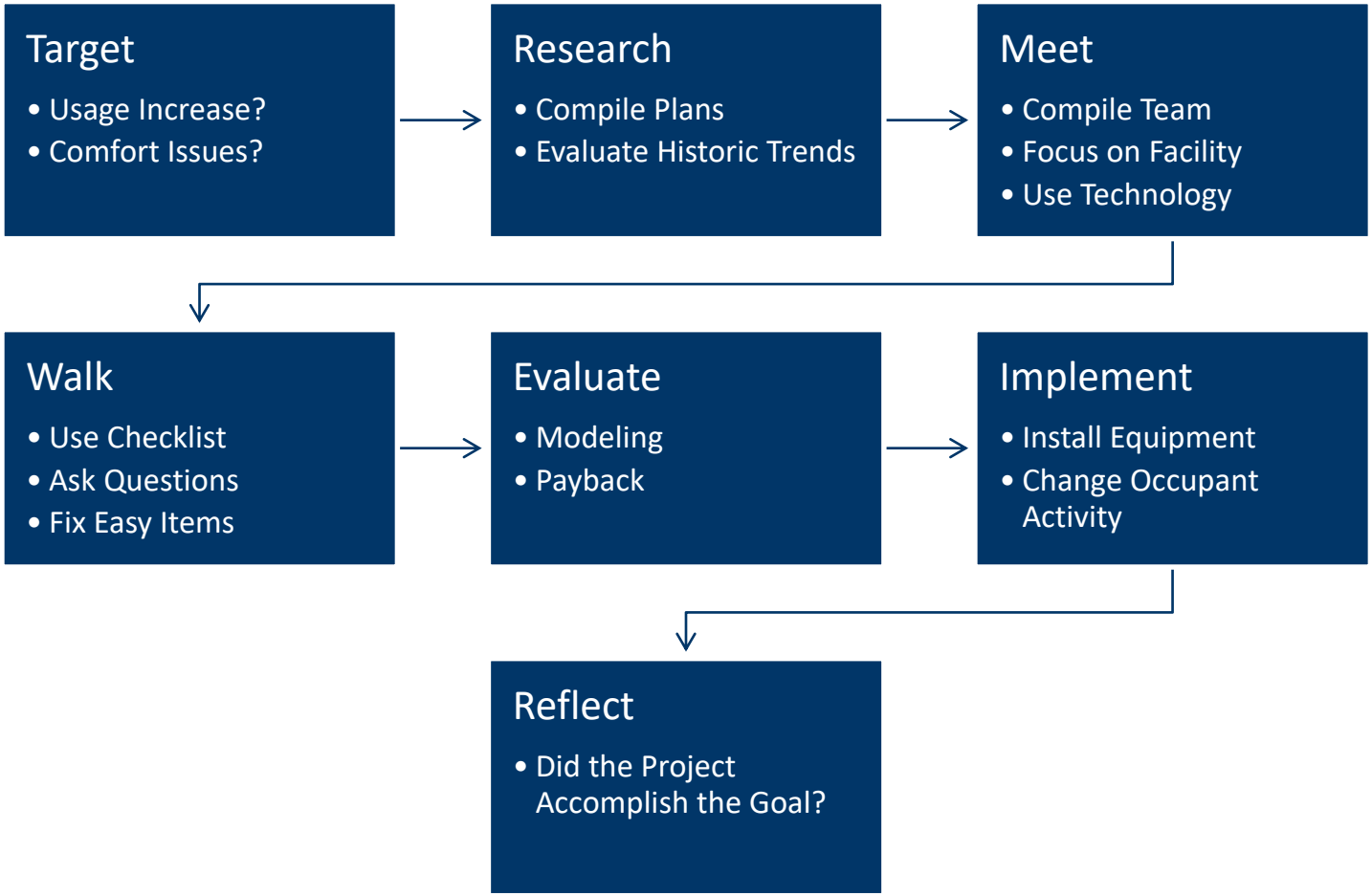
Direct Relationship to ENERGY STAR



DMPS and Treasure Hunts

- Use Treasure Hunts as an Opportunity to Explore Facilities and Determine Savings Opportunities
- Process has Evolved Over the Years to be More Productive
- Completed Treasure Hunts in 25 Facilities
- Proven to be a Valuable Tool to Operating Facilities Effectively and Efficiently

DMPS Treasure Hunt Process



East High School Treasure Hunt

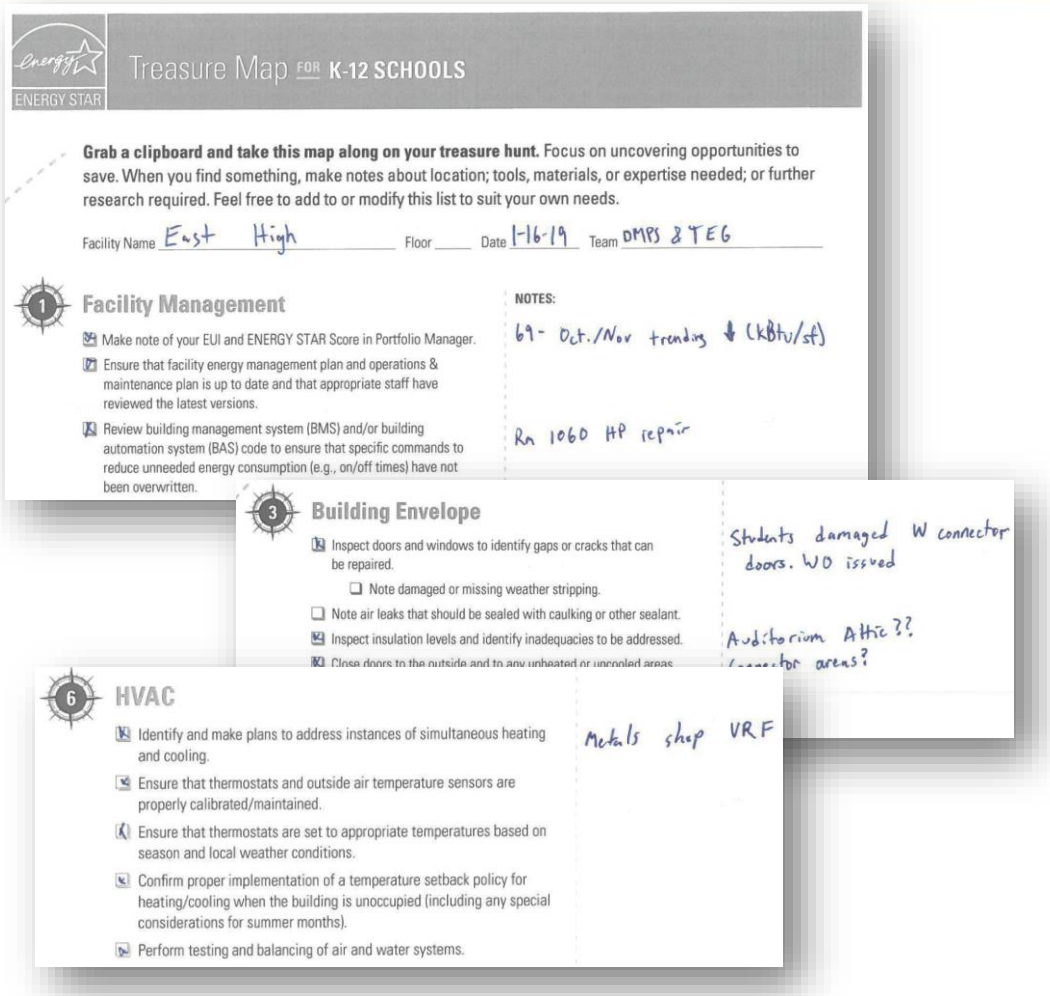
- One of Our Largest Facilities
- Built in 1912 with Multiple Additions/Renovations
- HVAC is a Combination of Steam, Heat Pump, VAV, VRF, Package Units

- Process Started in December 2018
- Projects Complete July 2019

Image sourced from: www.lampsplus.com

Walk

- At East High a Number of Savings Opportunities Were Identified
  - Exterior Door Seals
  - LED Lighting
  - Contraband Appliances
  - Shared Thermostats
  - Vestibule Heaters



ENERGY STAR

Treasure Map FOR K-12 SCHOOLS

Grab a clipboard and take this map along on your treasure hunt. Focus on uncovering opportunities to save. When you find something, make notes about location; tools, materials, or expertise needed; or further research required. Feel free to add to or modify this list to suit your own needs.

Facility Name East High Floor ____ Date 1-16-19 Team DMPS & TEG

1 **Facility Management**

- Make note of your EUI and ENERGY STAR Score in Portfolio Manager.
- Ensure that facility energy management plan and operations & maintenance plan is up to date and that appropriate staff have reviewed the latest versions.
- Review building management system (BMS) and/or building automation system (BAS) code to ensure that specific commands to reduce unneeded energy consumption (e.g., on/off times) have not been overwritten.

NOTES:

69- Oct./Nov trending ↓ (kBtu/sf)

Rm 1060 HP repair

3 **Building Envelope**

- Inspect doors and windows to identify gaps or cracks that can be repaired.
  - Note damaged or missing weather stripping.
- Note air leaks that should be sealed with caulking or other sealant.
- Inspect insulation levels and identify inadequacies to be addressed.
- Close doors to the outside and to any unheated or uncooled areas

Students damaged W connector doors. WO issued

Auditorium Attic ??

6 **HVAC**

- Identify and make plans to address instances of simultaneous heating and cooling.
- Ensure that thermostats and outside air temperature sensors are properly calibrated/maintained.
- Ensure that thermostats are set to appropriate temperatures based on season and local weather conditions.
- Confirm proper implementation of a temperature setback policy for heating/cooling when the building is unoccupied (including any special considerations for summer months).
- Perform testing and balancing of air and water systems.

Metals shop VRF

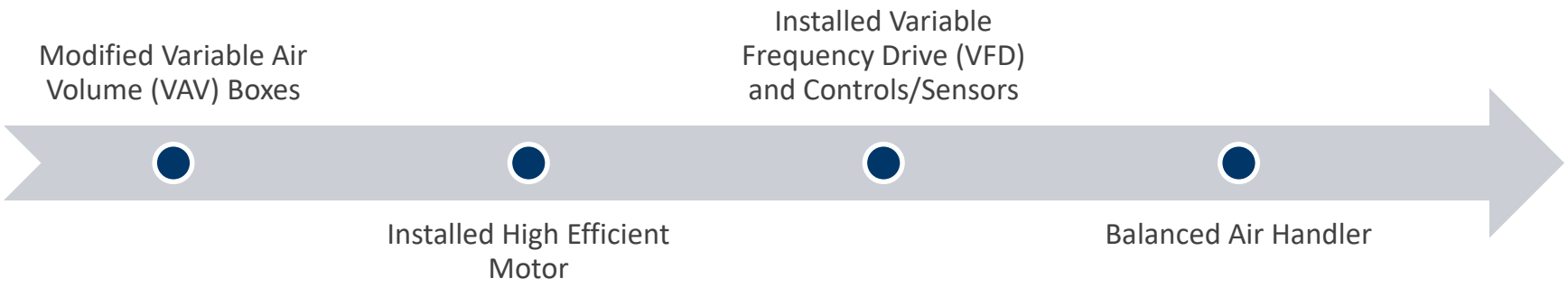
DesMoines PUBLIC SCHOOLS

Evaluate

Constant Volume Air Handler to Pressure Dependent System

- Option #1
  - New VAV Boxes
  - New High Efficiency Motor with VFD
- Option #2
  - Modify Existing VAV Boxes and add Flow Sensing Devices
  - New High Efficiency Motor with VFD
  - Add Sensors to Balance Pressure
- Economics of the Project Proved Option #2 to be the Best Choice

Implement



- Project Financials

- Total Project Cost = $17,509
- Utility Rebate = $7,711
- Out of Pocket Cost = $9,798

- Yearly Savings = $4,901

Simple Payback of 2 Years

Reflect

- Treasure Hunt Led to the Completion of Multiple Projects
- Increased Energy Savings and Occupant Comfort
- Increased the Useful Life of Equipment
- What Went Right? What Can Improve?

LED Treasure Hunt

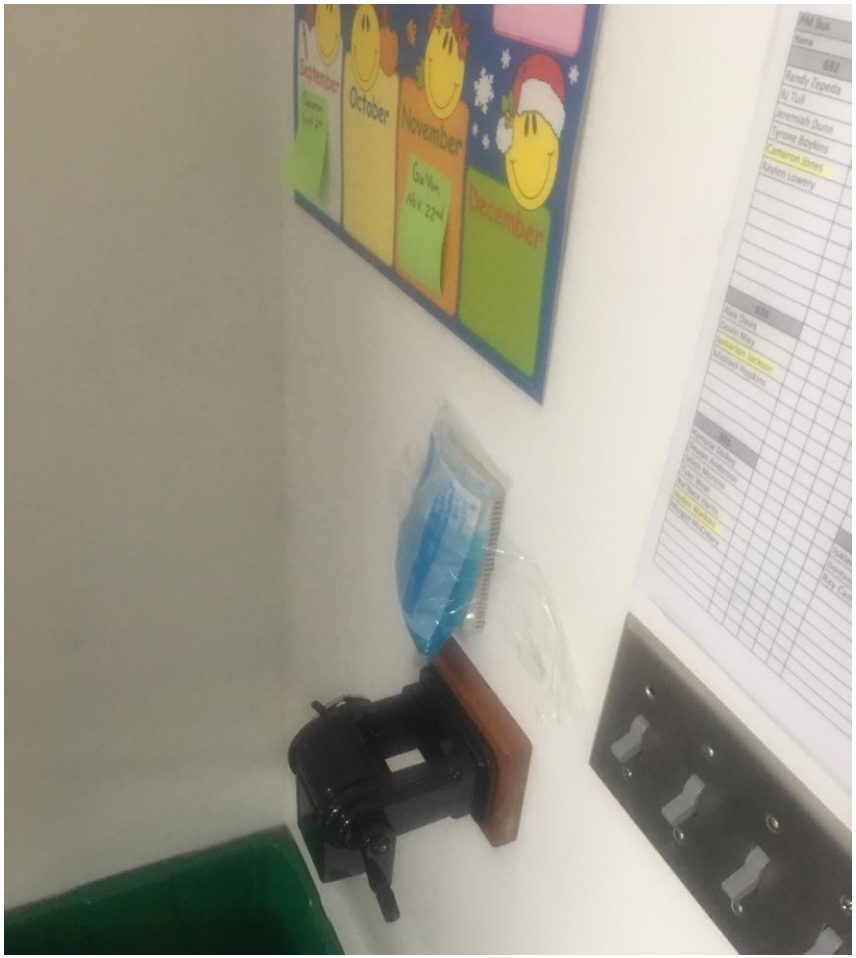
- District Initiative to be 100% LED
  - Currently 100% Exterior Fixtures Converted
  - At the time of the Treasure Hunt Approximately 96% of Interior Square Footage Had Been Converted

- Designed Treasure Hunt Activity to Engage Building Staff to Identify Remaining Lighting to be Changed
  - Electronic and Verbal Communication District Wide
  - Used Electronic Questionnaire to Compile Results

LED Treasure Hunt

- Nearly Half of Building Chiefs Responded Through Questionnaire
- Provided a Beverage Tumbler to Chiefs Who Participated
- Gave Facilities a Concise List of Areas Remaining

Treasure Hunting Gold



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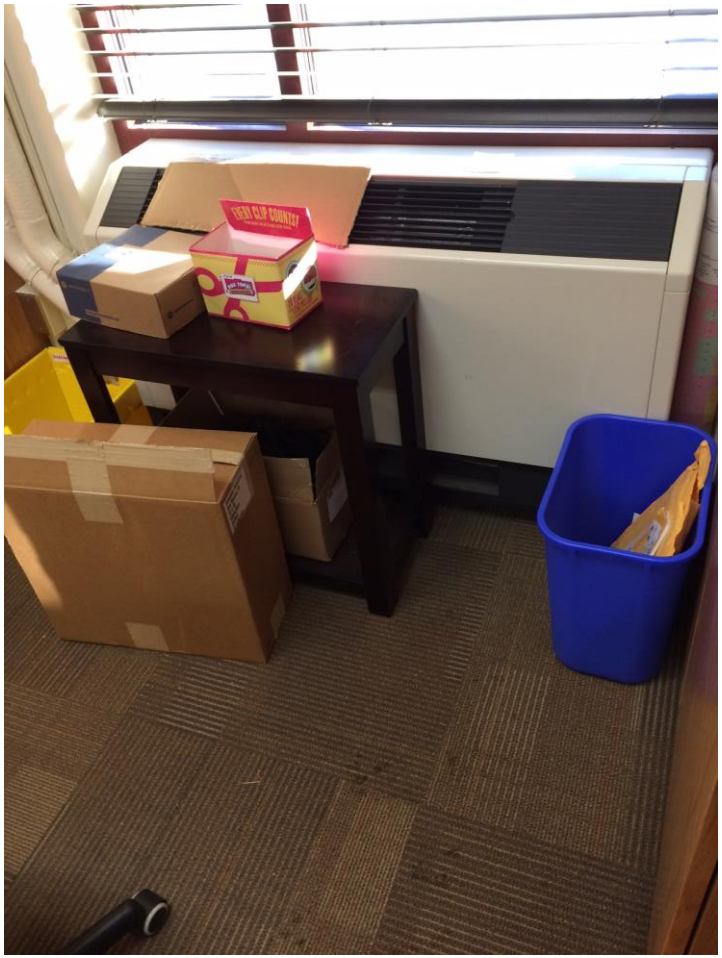

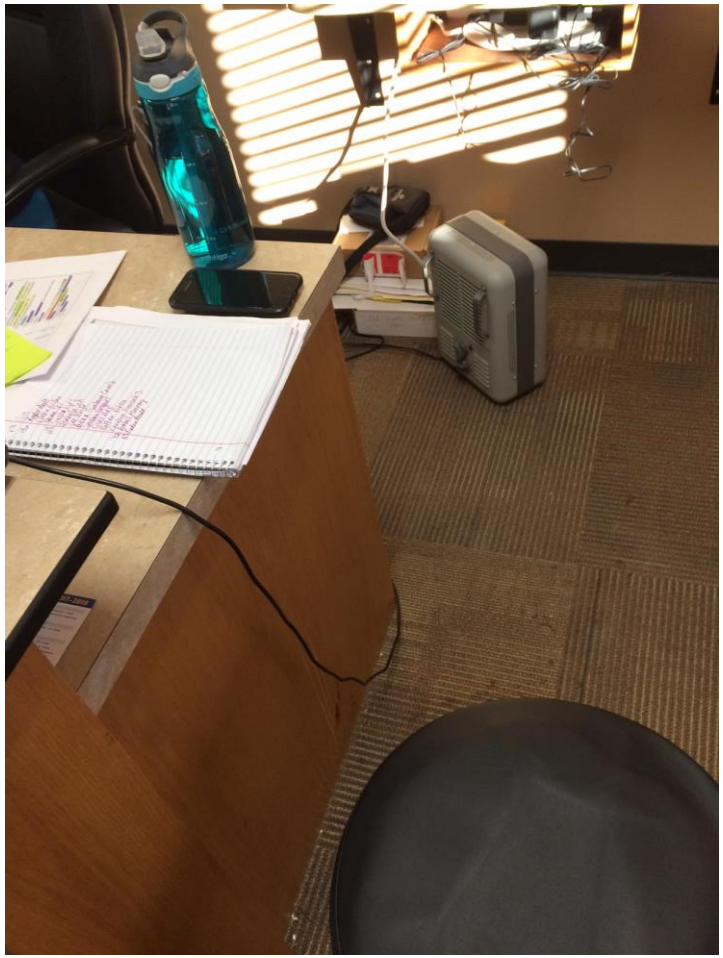

Treasure Hunting

- Engage Appropriate Personnel
- Listen to Occupants – Solve Problems
- Focus on One Issue at a Time
- Solutions Are Not Always Complex

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ENERGY STAR® Treasure Hunts from a Consultant's Perspective

2020 ENERGY STAR Partner of the Year Webinar

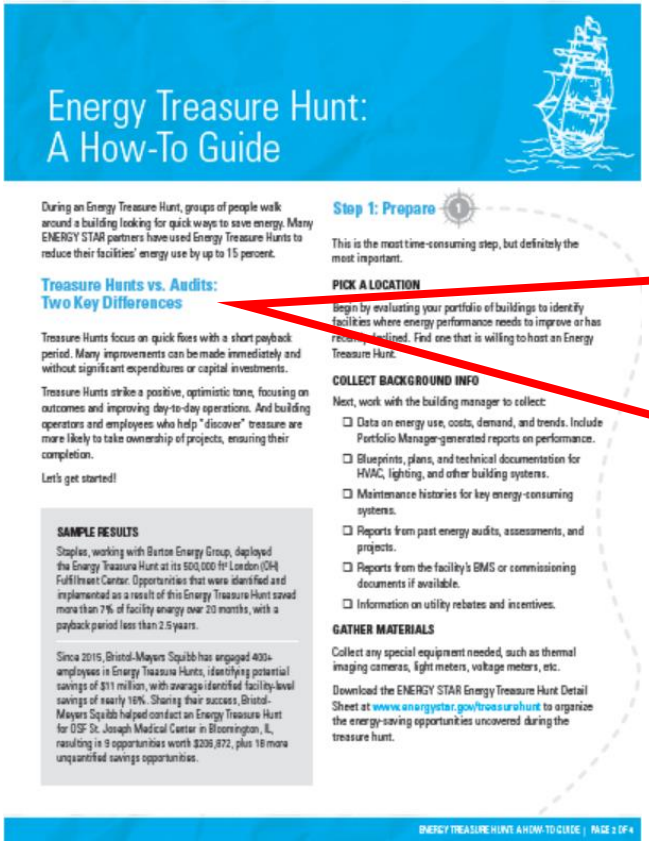
April 29, 2020

Barry Abramson


SERVIDYNE
ENERGY STAR
PARTNER OF THE YEAR
18
SERVIDYNE

Pirates and Pandemics Part 1: A Brief History of the Pirate Flag

Treasure Hunts vs. Audits



Energy Treasure Hunt:
A How-To Guide

During an Energy Treasure Hunt, groups of people walk around a building looking for quick ways to save energy. Many ENERGY STAR partners have used Energy Treasure Hunts to reduce their facilities' energy use by up to 15 percent.

Treasure Hunts vs. Audits: Two Key Differences

Treasure Hunts focus on quick fixes with a short payback period. Many improvements can be made immediately and without significant expenditures or capital investments.

Treasure Hunts strike a positive, optimistic tone, focusing on outcomes and improving day-to-day operations. And building operators and employees who help "discover" treasure are more likely to take ownership of projects, ensuring their completion.

Let's get started!

SAMPLE RESULTS

Staples, working with Burton Energy Group, deployed the Energy Treasure Hunt at its 500,000 ft² London (OH) Fulfillment Center. Opportunities that were identified and implemented as a result of this Energy Treasure Hunt saved more than 7% of facility energy over 20 months, with a payback period less than 2.5 years.

Since 2015, Bristol-Meyers Squibb has engaged 400+ employees in Energy Treasure Hunts, identifying potential savings of $11 million, with average identified facility-level savings of nearly 16%. Sharing their success, Bristol-Meyers Squibb helped conduct an Energy Treasure Hunt for OSF St. Joseph Medical Center in Bloomington, IL, resulting in 9 opportunities worth $206,872, plus 18 more unquantified savings opportunities.

Step 1: Prepare

This is the most time-consuming step, but definitely the most important.

PICK A LOCATION

Begin by evaluating your portfolio of buildings to identify facilities where energy performance needs to improve or has recently declined. Find one that is willing to host an Energy Treasure Hunt.

COLLECT BACKGROUND INFO

Next, work with the building manager to collect:

- ❑ Data on energy use, costs, demand, and trends. Include Portfolio Manager-generated reports on performance.
- ❑ Blueprints, plans, and technical documentation for HVAC, lighting, and other building systems.
- ❑ Maintenance histories for key energy-consuming systems.
- ❑ Reports from past energy audits, assessments, and projects.
- ❑ Reports from the facility's BMS or commissioning documents if available.
- ❑ Information on utility rebates and incentives.

GATHER MATERIALS

Collect any special equipment needed, such as thermal imaging cameras, light meters, voltage meters, etc.

Download the ENERGY STAR Energy Treasure Hunt Detail Sheet at www.energystar.gov/treasurehunt to organize the energy-saving opportunities uncovered during the treasure hunt.

ENERGY TREASURE HUNT: A HOW-TO GUIDE | PAGE 2 OF 4

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The Consultant's Role – Our Approach

KEEP SAYING TO YOURSELF: "NOT AN AUDIT! NOT AN AUDIT! NOT AN AUDIT!"

ENGAGE AND COLLABORATE FROM THE START

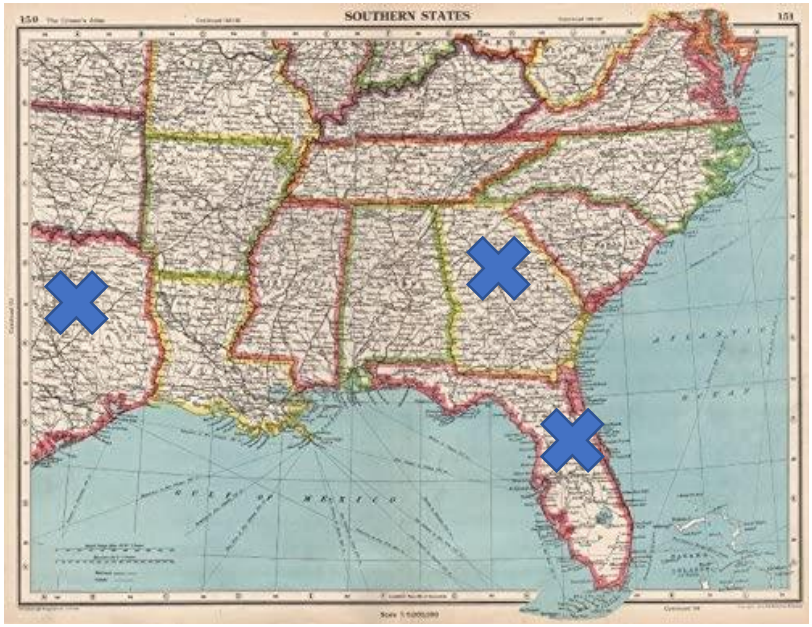
FOCUS ON QUICK FIXES BUT DON'T MISS OTHER OPPORTUNITIES

DISCUSS THE FINDINGS AND NEXT STEPS ON THE SPOT

FOLLOW UP WITH A ONE-PAGE LETTER TO REINFORCE THE EXPERIENCE AND ENCOURAGE CONTINUED PROGRESS

Testing the Concept

- The Client: Parmenter Realty Partners
- The Buildings:
  - 8 Class A office buildings
  - Clustered in 3 Metro areas – Orlando, Dallas and Atlanta
  - Multi-building properties managed by the same team per City
  - Total floor area 1.9 Million GSF
  - Mix of high and low ENERGY STAR scores



Testing the Concept

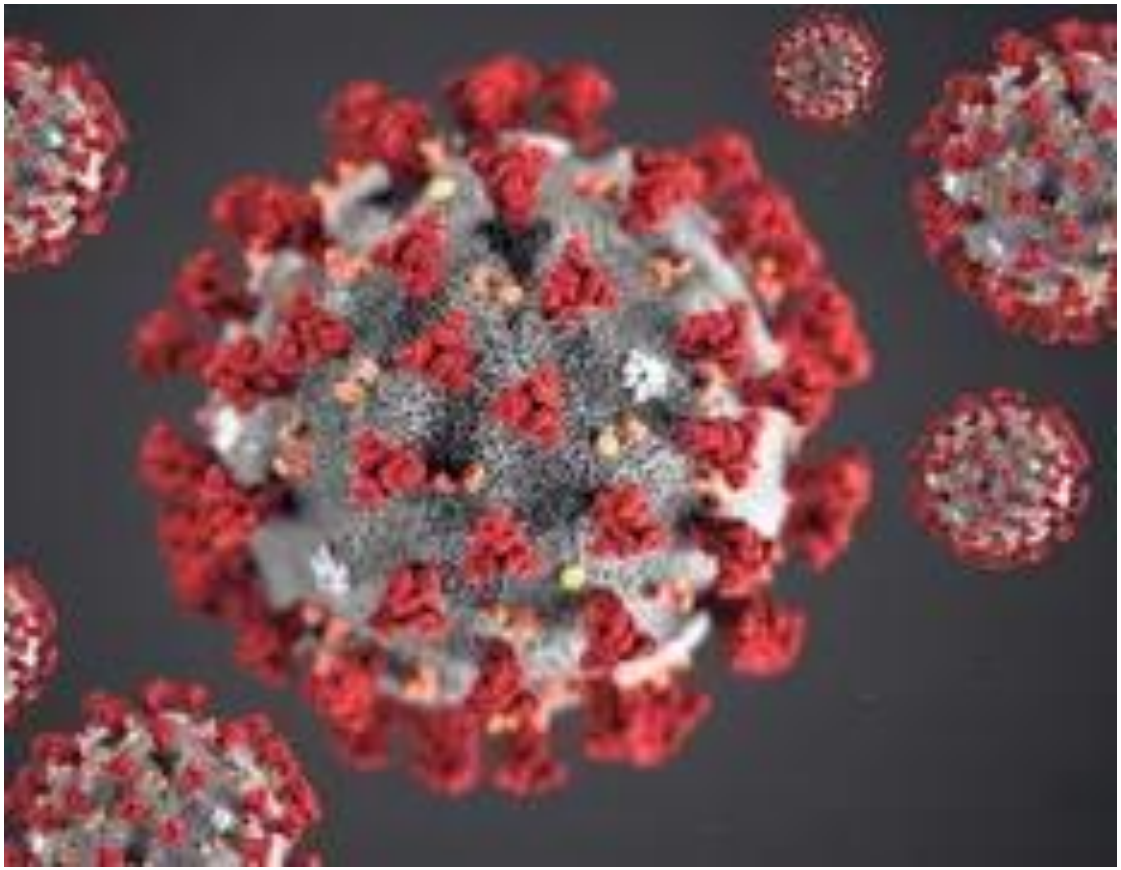
- The Timing
  - Conducted concurrently with ENERGY STAR Licensed Professional verification site visits
  - Sep/Oct 2019
  - Walk-throughs during occupied and unoccupied periods
- The Teams
  - Typically 4 people
  - Building Engineer, Property Manager, Asst. Property Manager, Consultant
- The Cost
  - $0

The Findings

- 52 opportunities identified in the 8 buildings
- 5% average energy savings potential
- Quick fix examples:

Opportunity	kWh/Yr	$/Yr
AHU Schedule Adjustments	175,000	$7,200
After-Hours Mode for Minimum Chiller Load	91,000	$4,100
Lighting Control Repairs	62,000	$5,600
Saturday On-Demand HVAC	39,000	$1,400
Static Pressure and Temperature Resets	26,000	$1,200
Unoccupied Floor Setback Mode	12,000	$1,700
Totals	**405,000**	**$21,200**

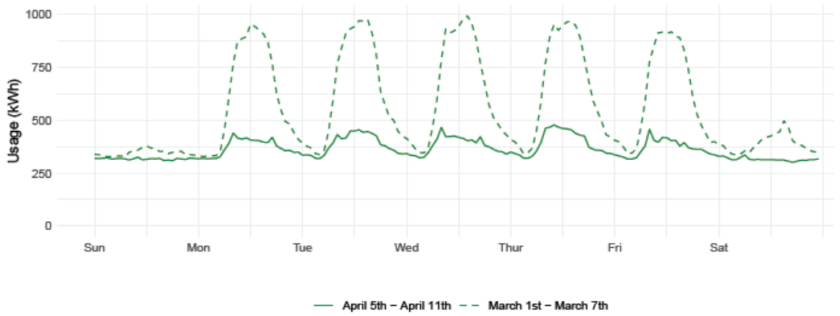
Pirates and Pandemics Part 2: Unlocking the Treasure Chest

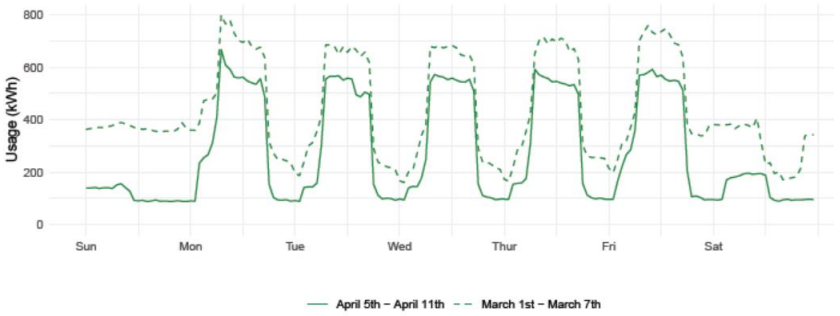


The Multiplier Effect

- Most quick fix measures addressed energy waste during unoccupied periods
- More widely applicable when building occupancy dropped
- Unoccupied Floor Setback
  - One floor at $1,700 /Yr to 28 floors at $1,700 every 2 weeks
- After-Hours Minimum Chiller Load
  - 2 X savings potential when applied 24/7
- Measures were ready to be implemented on a widespread basis immediately

Some Buildings were Prepared to Quickly Unlock the Treasure Chest





Pirates and Pandemics Part 3: Avoiding Davy Jones' Locker

Not an Audit – and No Audit Report

- Energy Audit typical result:
  - Report becomes buried treasure, never to be found
- ENERGY STAR Treasure Hunt result:
  - Discussion among those who can take action
    - What can be done immediately
    - What can be done in the very near term
    - What can be incorporated in longer-range plans

Implementation to Date

Opportunity	Status
Unoccupied Floor Setback Mode	Complete (expanded to all floors)
Lighting Control Repairs	Complete
OA AHU Scheduling Adjustment	Complete
T-12 Fixture Replacement	Complete
Fitness Center Lighting Occupancy Sensor	Planned
Stairwell LED Lighting	Planned
Lobby LED Lighting	Under Consideration
Garage LED Lighting	Under Consideration

Questions & Comments

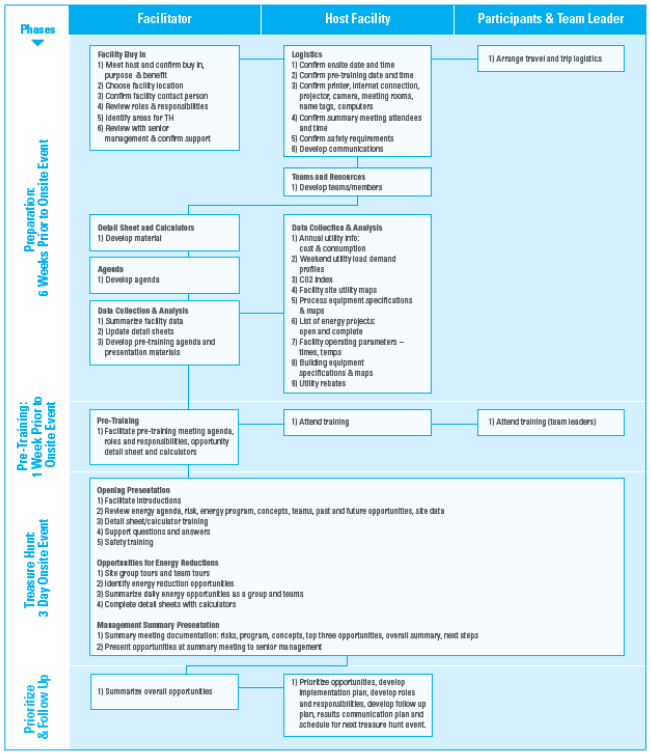
- Please submit your questions in the chat box
- We will try to address as many questions as we can in the time we have
- If your question was not addressed, please feel free to contact us via at tunnessen.walt@epa.gov

Treasure Hunts require advance planning

Tip: Give yourself of time to:

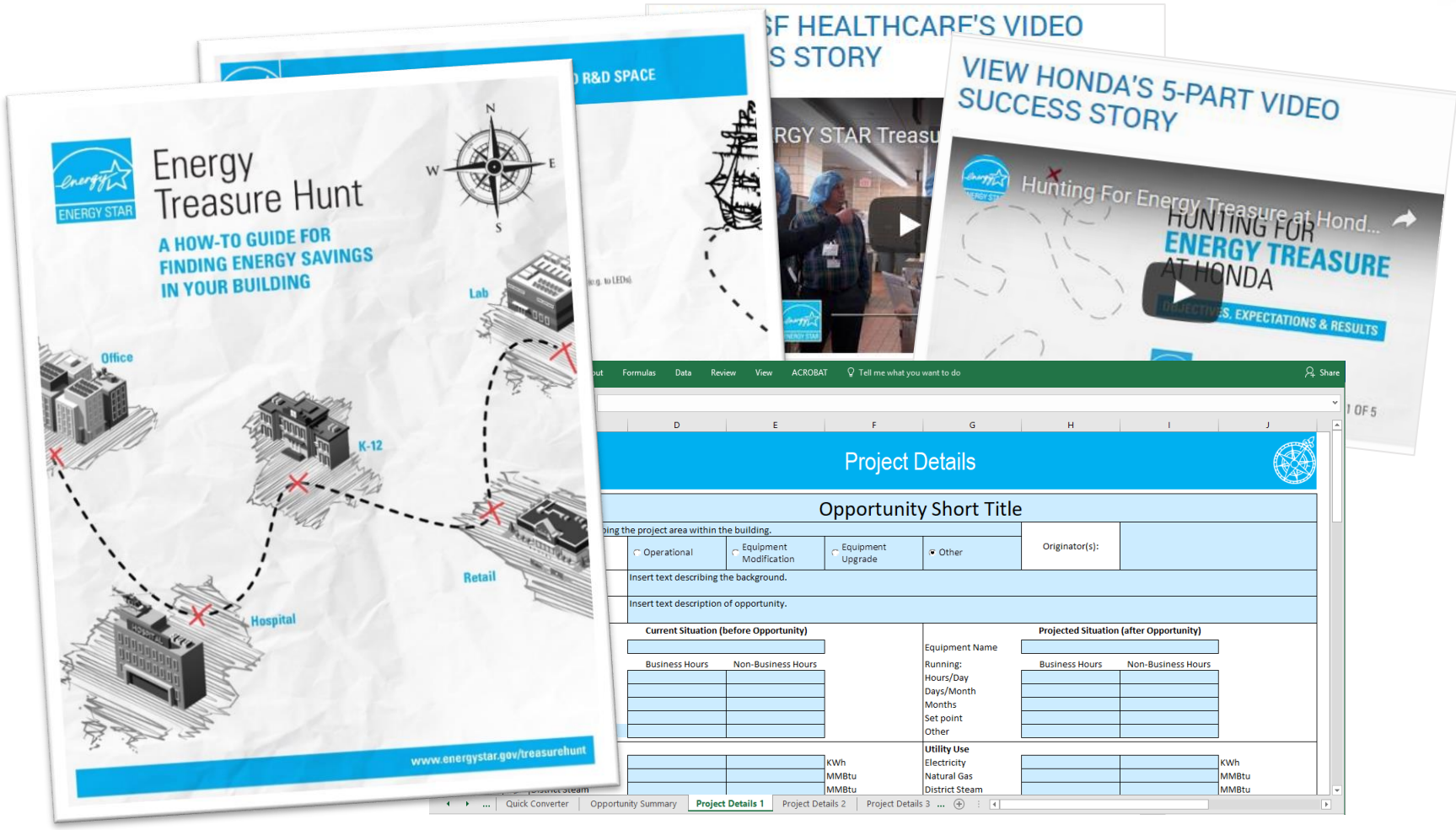
- Secure permission to conduct hunt at host site
- Confirm site's management will attend report-out meeting
- Form teams & get approval for people's time
- Gather energy information, data, site plans, etc.
- Train teams on TH approach, tools, etc.
- Finalize logistics for event

FIGURE 3: Energy Treasure Hunt Phases and Roles



Flow chart from the treasure hunt guidebook

Start Planning Your Treasure Hunt



www.energystar.gov/TreasureHunt

Find the Treasure Campaign

1. Conduct an Energy Treasure Hunt

- Organize a treasure hunts
- Identify potential savings

2. Add your energy savings to the Treasure Chest!

- Share treasure hunt findings at www.enegystar.gov/treasurehunt

3. Get EPA Recognition for participating

- Be featured on www.energystar.gov/treasurehunt webpage
- Receive a printable certificate noting their contributions
- Be included in an EPA communications about the campaign

Upcoming 2020 Award Winner Webinars

May 28 @ 1 PM EDT	**Strategies for Setting Effective Energy Performance Goals**
June 24 @ 2 PM EDT	**How to Develop Playbooks and Employee Guides for Energy Efficiency**
September 10 @ 1 PM EDT	**Innovative Technologies Part 1 – Battery Storage**
October 8 @ 1 PM EDT	**Innovative Technologies Part 2 – Building Controls**
November 18 @ 2PM EST	**Communicating Your Energy Plants and Achievements**
December 3 @ 1 PM EST	**Lighting up Energy Savings with LED Upgrades**

https://www.energystar.gov/buildings/training/poy_webinars